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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/750,576	12/28/2000	Heu-Gon Kim	5000-1-181	6522

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EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 02/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/750,576	KIM ET AL.
Examiner	Art Unit	
Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 26 November 2002.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-7 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-7 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). _____ .
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . 6) Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on *November 26, 2002* has been entered.
2. This Office Action is in response to applicant's amendment filed on October 29, 2002, which has been entered as paper number 8.
3. By this amendment, the applicant has amended claim 1.
4. Claims 1-7 remain pending in this application.

Response to Amendment

5. The amendment filed on October 29, 2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: *claim 1 has been amended* to include the feature having "the width of each stripe along the optical fiber becomes narrower as the stripe is positioned further away from the optical axis". The specification specifically teaches that the "as result, the widths of grating stripe patterns formed along the optical fiber 37 through the light projected through the amplitude mask have *identical width*, as in Figure 7", (please see page 11 lines 15-17).

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph**, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The reasons for rejection based on the new matters are set forth in the paragraph above. Claims 2-7 inherit the rejection from their based claim.

8. **Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph**, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. *Claim 1 has been amended* to include the feature having the width of each stripe becomes narrower however in earlier part of the claim states that only a *single* period and a *single* width of the stripe are set so the specification fails to teach adequately how could the apparent contradictions can be achieved. Also the specification fails to teach *how to* fabricate the fiber grating with the stripe width becomes narrower. Since the application is concerned with the *method of fabricating* a fiber grating, the actual method step needed to be explicitly taught and disclosed.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. **Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph**, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The

omitted steps are: the logical connections between the step of setting period of the fiber grating, the step of setting longitudinal ratio, the step of setting period of the amplitude mask and the step of setting the thickness of the amplitude mask. The four steps as stated are *arbitrary* to each other since there are no logical connections among them to define a *complete* and *operable* method for fabricating the grating.

The phrase “with the longitudinal ratio set in step (b)” recited in claim 1 is very confusing since it is not clear what does it mean by “with” and it is not clear how does this ratio has anything to do with the setting of the transverse ratio.

The term “setting” recited in claim 1 is confusing and indefinite since it is not clear what exactly is referred here as “setting”. It is not clear if it is *arbitrary selected* or there are certain determination steps concerning *determining* the parameters or if this term means “*adjusting* according to certain rule”.

The phrase “the converging point” is confusing and indefinite since the lens (32) as shown in the figures in the specification does not seem to converge any light.

Claims 2-7 inherit the rejections from their based claim. Applicant is respectfully requested to clarify all the discrepancies of the claims to make the claims in comply with the requirements of 35 USC 112.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Bhatia et al (PN. 6,269,208).**

Bhatia et al teaches an *apparatus and method* for photo-inducing a fiber grating in a waveguide wherein the apparatus comprises a *ultraviolet light source* (16) for generating a UV light, a lens system

(24).serves as the *lens field* for converging the UV light form the source and an *amplitude mask* (120) for selectively transmitting the UV light onto a waveguide (128), (please see Figures 1 and 4, columns 3-4 and 6-7). Bhatia et al teaches that the amplitude mask has a defined period as shown in Figure 4. Bhatia et al also teaches that the apparatus is arranged to have the distance between the converging point of the lens system and the amplitude mask designated as “ Z_A ” and the distance between the amplitude mask and the waveguide designated as “ d_A ”, (please see Figure 4 and column 7, lines 10-25). This means the claimed *longitudinal ratio* is well defined as $Z_A/(d_A + Z_A)$. By simple geometrical calculation, the period for the grating formed on the waveguide can be determined and it is proportional to the period of the amplitude mask. In fact, the claimed *transverse ratio* (Λ_0/Λ), which is the ratio between the period of amplitude mask (Λ_0) and the period of the grating (Λ), is equal to the longitudinal ratio $Z_A/(d_A + Z_A)$. The grating and the stripe pattern with the periodicity are then determined by the geometry of the apparatus.

The amplitude mask implicitly has *certain thickness* and the pattern of the grating on the optical fiber certainly is matched up with the pattern of the mask. It is implicitly true that the thickness of the amplitude mask plays the important role in determining the modulation, therefore the grating pattern, impart on the incident light. It is implicitly true that the light distribution on the light exit side surface of the mask determines the grating pattern or the stripe pattern of the fiber grating. Since Bhatia et al teaches that the fiber grating is formed on the fiber via the amplitude mask it is implicitly true that the thickness of the amplitude mask *is set* for generating the stripe pattern of the fiber grating.

Claim 1 has been amended to include the feature that the light source and the rest of the elements are arranged on an optical axis. Bhatia et al does not teach such explicitly. However to have the light source placed along the same optical axis or not does not change the operation of the apparatus for fabricating the fiber grating. Such modification is therefore considered to be obvious matters of design choice to one skilled in the art.

Claim 1 has been amended to include the feature that the width of the each stripe along the optical fiber becomes narrower as the stripe is positioned further away from the optical axis. However the specification of the instant application *fails* to teach how could a single width of the stripe being set in the fabricating step yet the width will become narrower. The specification also fails to provide the manufacturing step for *enabling* the variation of the width of the stripe. Such feature therefore cannot be addressed with details. It is conventionally known to vary the modulation width of the grating stripe pattern to form the apodized fiber grating. It would then have been obvious to one skilled in the art to modify the grating stripe pattern for the benefit of further control the apodization of the fiber grating.

With regard to claim 2, Bhatia et al teaches that the UV laser light source is an *excimer laser* source, (please see column 3 lines 59-65).

With regard to claims 3, Bhatia et al teaches that the lens system includes a *cylindrical lens* (24, Figure 1), but it does not teach explicitly that it also includes a concave lens. However Bhatia et al teaches specifically that the pitch spacing of the resulting grating on the waveguide is controlled by the rate of divergence of the amplitude mask and the distance between the waveguide and the mask, (please see column 7, lines 10-15). It would then have been obvious to one skilled in the art to add additional optical element to control the divergence of the light through the mask for the benefit of obtaining desired pitch for the grating on the waveguide. A concave lens is a well-known optical element that adds divergence to the light beam. It would therefore have been one of the obvious options and design choices to one skilled in the art to design the apparatus to obtain desired grating pitch. Furthermore, it has been held when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involve only routine skill in the art. *In re Aller*, 105 USPQ 233. With regard to claim 4, it is implicitly true that the converging point of the lens field may be adjusted by varying the distance between the two lenses.

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With regard to claims 5 and 6, exposing the amplitude mask with the UV light forms the fiber grating.

With regard to claim 7, Bhatia et al does not teach explicitly about the size of the periodicity of the amplitude in comparison with the wavelength of the writing UV laser light. However it is implicitly true that the periodicity must be greater than the wavelength in order to photo-inducing the mask pattern on the waveguide without causing the UV light passing through the mask to interfere with each other.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. **Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 10 of U.S. Patent No. 6,201,911.** Although the conflicting claims are not identical, they are not patentably distinct from each other because they essentially disclose the same apparatus and method implicitly included for manufacturing a fiber grating using ultraviolet laser light source and an amplitude mask. The amendment to claim 1 with regard to the position of the light source is considered to be obvious matter of design choice to one skilled in the art since the position of the light source does not change the fabrication of the fiber grating. The amendment

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to claim 1 concerning the width of the stripe does not distinguish the claim from the cited patent since the specification fails to give support and disclosure for achieving such.

Response to Arguments

3. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection. The newly amended features have been fully considered and they are rejected for the reasons stated in the paragraphs above. Applicant's arguments are mainly based on the newly amended claims and they have been fully addressed in the paragraphs above.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-9956.

A. Chang, Ph.D.
February 4, 2003

Audrey Y. Chang
Primary Examiner
Art Unit 2872